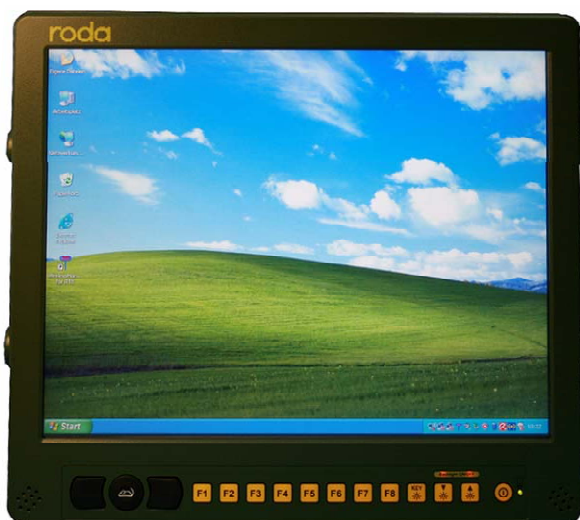


# User Manual

## Display

### RD15







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Author: Christian Fessler

#### Version History:

Version	Description	Date	Written by
1.0	Created	15.02.11	C. Fessler
1.1	Removed PIP option	21.02.11	C. Fessler
1.2	Revised version	24.02.11	C. Fessler
1.3	OSD menu PD/SD renamed	09.03.11	C. Fessler

## **Trademark Acknowledgments**

All product and company names are trademarks or registered trademarks of their respective holders.

## Conventions

This manual is divided into individual chapter with interdependent contents. If you have experience with the use of computers and/or displays, you may skip individual chapters or directly look up the respective keywords.

Pictures and tables are numbered consecutively.

Keys and key combinations are written in square brackets, e.g., [Ctrl]+[Alt]+[F1] means that you must press Control, Alt and F1 keys simultaneously.

## Note

Notes contain important information in connection with the directly related text or chapter.

## Attention



You will find Attention notes where data loss or display damage may be the result of non-compliance with this note.

## Warning



Warnings inform you that personal damage or damage to the display or individual components thereof may be the consequence or carelessness or non-compliance with the respective warning.

## **Regulatory information / Disclaimers**

Installation and use of this RD15 must be in strict accordance with the instructions included in the user documentation provided with the product. Any changes or modifications (including the antennas) made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment.

The manufacturer is not responsible for any radio or television interference caused by unauthorized modification of this device, or the substitution of the connecting cables and equipment other than manufacturer specified. It is the responsibility of the user to correct any interference caused by such unauthorized modification, substitution or attachment. Manufacturer and its authorized resellers or distributors will assume no liability for any damage or violation of government regulations arising from failing to comply with these guidelines.

*Note: Descriptions made in this manual are done for standard RD15. Depending on costumers configuration your device may vary.*

## **CE**

Products with the CE Marking comply with both the EMC Directive (2004/108/EC) and the Low Voltage Directive (2006/95/EC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms:

**EN 55022** ( CISPR 22 ) Radio Frequency Interference

**EN 55024** ( EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6,EN61000-4-8,EN61000-4-11,EN61000-3-2, EN61000-3-3) Generic Immunity Standard

**LVD** EN 60950 ( IEC950 ) Product Safety, IEC 60950-1:2005

## **Recycling**

All materials used in the construction of this unit are recyclable or environmentally friendly. Please recycle the packing materials, and at the end of the computer's life, all other materials in accordance with the local regulations.

Please refer "Material and Recycling" for the contents of the materials.



*Note:*

- *The equipment may still contain tiny amount of hazardous substances for health and environment, though those are below control level.*
- *To avoid spreading such substances into the eco system, and to minimize the pressure on the environment, you are encouraged to use the appropriate take-back for reusing or recycling most of the materials in a safe way after the service life.*
- *The crossed bin symbol indicates proper disposal is required.*
- *For more information on collection, reuse and recycling, please consult the local or regional waste administration for more information.*

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# CHAPTER 1

## Getting Started

## **1 Getting Started**

### **1.1 Introduction**

The multi functional 15" XGA display RD15 with a XGA Resolution of 1024 x 768 pixels allows operation under extreme environmental conditions. It was designed according to MIL-STD 810F and offers maximum protection against shock, vibration, dust and humidity. You can find detailed information in chapter 3 Specifications.

You can also set the brightness of the keyboard. It can be changed together with backlight brightness.

The ON/OFF button also shuts ON/OFF devices with DP-DVI (MilDef RT/RK/RF) if connected with a DVI cable. To avoid shutting ON/OFF the display and any DP-DVI device by mistake, the ON/OFF button features a delayed circuit. The ON/OFF button must be pressed for around 5 seconds in order to shut the system ON/OFF.

The display unit is equipped with a sun light readable resistive touch screen with circular polarizer, a USB keyboard with 8 function keys (F1-F8), stereo amplifier with 2 speakers and an integrated 2port USB hub to connect additional USB hardware.

The roda RD15 has signal input devices for DVI and RGB analogue. The signal sources can be chosen by the On Screen Display (OSD). Representation can be in 1:1 (scaled) or it can be in the usual resolutions like 640x480, 800x600 and 1024x768.

The RD15 is equipped with a foil keyboard with backlight and a mouse joystick with left and right mouse button.

### **Signal inputs**

The display has connectors for DVI and VGA (RGB) signal. Primary signal source (DVI/VGA) will be selected automatically.

Please use this list to check the package contents for completeness. Contact dealer if one or more of the following listed items are not contained in the package. Please note: most accessories are optional and not part of RD15 standard delivery.

- External AC/DC adapter (optional)
- VGA (RGB) cable (optional)
- DVI cable (optional)
- Customized accessories (optional)
- Utility CD
- RD15 display (always part of delivery)



Figure 1: Display

## 1.2 View

### 1.2.1 Front view



Figure 2: Front view

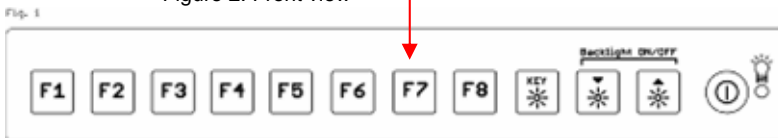


Figure 3: Foil keyboard

From left to right:

Left mouse button: Executes left mouse click

Mouse joystick: Moves mouse button

Right mouse button: Executes right mouse click

F1-F8: Function keys

Key: Toggle function

Brightness down: Display backlight brightness down

Brightness up: Display backlight brightness up

Power ON/OFF: Display power ON/OFF

(with DP-DVI: notebook + display power ON/OFF)

[Brightness down] + [Brightness up] = Display + keyboard backlight ON/OFF immediately

[Key] + [Brightness down/up] = Keyboard backlight brightness down/up



1.2.2 Rear view

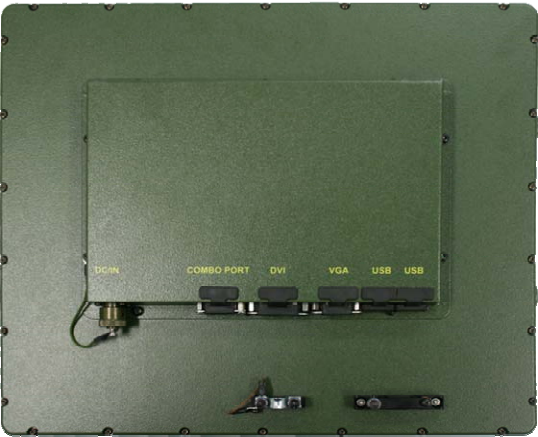


Figure 4: Rear view

1.2.3 Connector panel

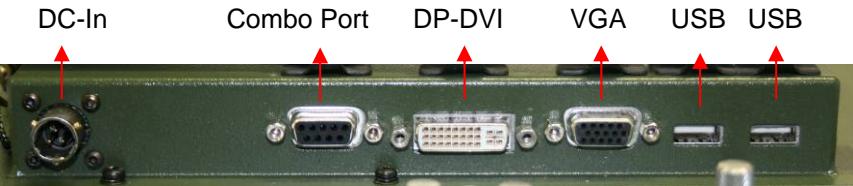


Figure 5: Connector panel

Name	Function	Connector type
DC-In	Power supply	3pin VG96912A8-98 PN
Combo Port	Combo Port	9pin Sub-D jack
DP-DVI	DVI / Combo	DVI-AD jack
VGA (RGB)	VGA/RGB-Analog	15pin Sub-D-HD jack
USB 2x	USB Full Speed Downstream	USB A jack

Table 1: Connector panel

1.2.4 Left/right side view



Figure 6: View left/right



Figure 7: View left/right volume up/down

### 1.2.5 Top side view



Figure 8: Top side view (OSD buttons)

## 1.3 Preparing the RD15

- Unpack RD15. Add any mounting devices if applicable. Screws are not a part of standard delivery.
- Fasten the screws carefully. Damaging the screw threads may be a result of you put too much pressure in the screws.
- Connect the line cable with the power-supply unit and plug the plug into the electrical outlet. Plug the DC plug of the power-supply unit into the DC input of the RD15 and lock the connector well clockwise.

*Note: The enclosed line cable complies with the specifications of the country in which the display was purchased. Please ensure that the line cable has been approved for the country in which the display will be used. Find further information on country-specific power plug version in the Annex.*

- Connect VGA or DVI with your computer. Then connect your computer with your display using the VGA/DVI cable.
- Turn your display ON using the power button.
- If the display shows the message “No signal” activating the corresponding signal source might be necessary. Depending on your used signal source, this can be done via software or hardware settings.



The graphical output during POST can vary and depends on BIOS settings. It is possible that you need to boot up an operating system in order to use your display.

# CHAPTER 2

## Components and Operations

## **2 Components and Operations**

### **2.1 Location**

A clean and moisture-free environment is preferred. Make room for air circulation.

Avoid areas with:

- Sudden or extreme changes in temperature.
- Extreme heat.
- Strong electromagnetic fields (near television set, motor rotation area, etc.).
- Dust or high humidity.

If it is necessary to work in a hostile environment, please regularly maintain your display by cleaning dust, water, etc. to keep it in optimal condition.

### **2.2 Ruggedness**

The display is designed with rugged features as vibration, shock, dust, and rain/water protection. However, it is still necessary to provide appropriate protection while operating in harsh environments. NEVER immerse the display completely in water. Doing so may cause permanent damages. Drop may cause parts break or permanent damages.

The I/O ports and devices must have caps tightly closed or cable inlets sealed while exposed to water or dust.

All connectors will corrode if exposed to water or moisture. Corrosion is accelerated if the power is ON. Please take proper measures in cable connection to avoid water entering into connectors. The DC jack and cables are sealed and may be operated with water splashing while attached. All port covers should be in place when no cable is attached.

### **2.3 Displays power supply**

You can power the display via AC/DC adapter.

### 2.3.1 AC/DC adapter



Figure 9: AC/DC adapter (design may vary)

The enclosed mains adapter automatically adjusts to the line voltage of the respective country. Make sure you have the correct country-specific power-plug version (see Annex B).



For power supply, only use original manufacturer parts provided for this display. Otherwise you may cause damage to the display and/or externally connected peripherals. Moreover, the manufacturer's warranty will forfeit if you ignore these instructions.

### 2.4 Power down

To power down the display, press the power button.

## 2.5 Interfaces

The standard RD15 display is equipped with several interfaces:

### USB

2 USB 2.0 interfaces. Those interfaces a standard USB 2.0 interfaces and are USB 1.1 compatible.

### VGA (RGB)

You can use a VGA cable to connect to any standard VGA source.

### DP-DVI

You can connect any single link DVI signal source with the DP-DVI interface. Additional you can connect MilDef DP-DVI signal sources to use DVI, USB and Remote ON/OFF function.



Don't use a dual link signal source together with a dual link DVI cable and a DP-DVI interface. This can cause malfunctions and damages. Use a single link DVI cable instead.

### DC-In (power supply)

DC connector for AC/DC adapter.



Only use this interfaces with the devices designed to be connected to DC-In Interface.

### Combo Port

Connect a Combo port cable with the Combo port and a non DP-DVI notebook to use USB and line in functionality.



Don't use a Combo port cable and DVI cable simultaneously. Use a VGA (RGB) cable instead.

2.6 Keyboard

Front horizontal (left to right)

1	2	3	4	5	6	7	8	9	10	11	12
F1	F2	F3	F4	F5	F6	F7	F8	Key	Brightness Down	Brightness Up	Power ON/OFF

RD15 Top – OSD menu (left to right)

1	2	3	4
Exit Menu/Submenu	Menu navigation left / Reduce value	Menu navigation right / Increase value	Enter

Left side volume (top down)

1	2
Volume up	Volume down

2.7 Touch screen

Use a stylus pen to handle the touch screen. Operating the touch screen with your fingers may contaminate the touch screen und decrease the quality. In order to use the touch screen, the touch screen drivers have to be installed on the connected computer.

At ambient temperatures > 65°C pillowing is possible. This is a normal behavior and reversible as soon as the temperature is reducing. You can still operate the touch screen though.



# CHAPTER 3

## Specifications

3 Specifications

3.1 Display

Component	Display RD15
Size	15" (31.8 cm)
Resolution (max.)	XGA 1024 x 768 Pixel, VGA, SVGA
Luminance	typ. 250 cd/m2
Contrast	480:1
Reaction time	25ms ton/toff
Angle of view	Horizontal, vertical: 160°
Displayable Colors	16.7 Mio or 256 shades of gray
Interfaces	DC-In, VGA, DP-DVI, 2x USB 2.0 max 500mA per port
H-Frequency	60 Hz
V-Frequency	60 Hz
Power supply	Nominal 19V DC, max 30W
Operating temperature	-32° to + 55°C
Storage temperature	-40° to + 80°C
IP	IP54 according to EN60529
Color	Nato green (RAL6031HR)
Dimensions (WxHxD)	351 x 300 x 57 mm
Weight	Ca. 3.5 kg
Environment	MIL-STD 810F
EMI	MIL-STD 461E, VG95373, EN 61000-4-2, EN 61000-4-3

Table 2: Components display

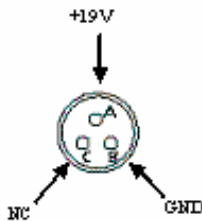
3.1.1 AC/DC adapter (Option)

Features	Input voltage: AC 100V ~ 240V 50/60Hz (47Hz~63Hz) Output voltage: DC 19V ± 1V, max. 90W Also complies with military power source 100V ~ 240V 400Hz Dimensions: 160mm x 58mm x 30mm Weight: 650g
----------	---

Table 3: AC/DC adapter

3.2 Interfaces

3.2.1 DC-In



Connector: SJT00RT-8-33PN014

Pin assignment:

Signal	Description	Pin
19V DC	Power supply 19V	1/A
GND	GND	2/B
n/c		3/C

Table 4: DC-In interface

*Note: 19V nominal voltage*

3.2.2 Combo port

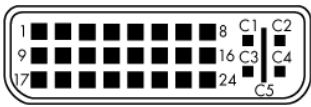
Connector: 9pin Sub-D

Pin assignment:

Signal	Note	Pin
GND	USB A, Audio plug	1
n/c		2
USB IN+	USB A plug	3
USB IN-	USB A plug	4
Audio IN L	3.5 mm audio plug	5
n/c		6
n/c		7
n/c		8
Audio IN R	3.5 mm audio plug	9

Table 5: Combo port interface

3.2.3 DVI



Connector: DVI-AD jack

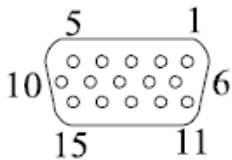
Pin assignment:

Signal	Pin
TX2-	1
TX2+	2
GND	3
PWRSW (Syspwr. Switch)	4
Heater sense	5
DDC CLK	6
DDC Data	7

Signal	Pin
Heater SW	8
TX1-	9
TX1+	10
GND	11
Speaker L	12
Speaker R	13
+5V	14
GND	15
+5V	16
TX0-	17
TX0+	18
GND	19
USB1 TX-	20
USB1 TX+	21
GND	22
TXC+	23
TXC-	24
n/c	C1
n/c	C2
n/c	C3
n/c	C4
GND	C5
GND	C6

Table 6: DP-DVI interface

3.2.4 VGA/RGB analog



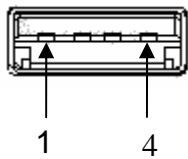
Connector: 15pin Sub-D

Pin assignment:

Signal	Pin
Red	1
Green	2
Blue	3
GND	4
GND	5
GND	6
GND	7
GND	8
GND	9
GND	10
GND	11
SDA (DDC serial data)	12
BHSYNC	13
BVSYNC	14
SCL (DDC data clock)	15

Table 7: VGA (RGB) interface

3.2.5 USB 2x



Connector: USB A jack

Pin assignment:

Signal	Pin
VCC	1
USB-	2
USB+	3
GND	4

Table 8: USB interface

3.3 Environmental and EMI rating

3.3.1 MIL-STD-810F

Item	Criteria
Temperature	According to MIL-STD-810F, Method 501.4 and 502.4, Procedure I, II
Vibration	According to MIL-STD-810F, Method 514.5 Category 20, Procedure 1, Figure 514.5C-3
Shock	According to MIL-STD-810F, Method 516.5 Procedure I <ul style="list-style-type: none"><li>15g, 3ms 100 shocks vertical half sine</li><li>100g, 0.5ms 2 shocks per axis, half sine</li><li>25g, 6ms 3 shocks per axis, half sine</li></ul>

Table 9: MIL-STD-810F

3.3.2 MIL-STD-461E

Item	Criteria
MIL-STD-461E	CE101, CE102, RE102, CS101, CS114, CS115, RS103

Table 10: MIL-STD-461E

3.3.3 VG95373

Item	Criteria
VG95373	LA01G, SA02G, SA04G, SF03G, LF01G, LF02G, LF03G, LG07G

Table 11: VG95373



# CHAPTER 4

## OSD Menu

4    **OSD Menu**

Press any OSD menu button to enter OSD main menu. You can navigate with the up down buttons. Select sub menu with enter. You can exit sub menus and main menu with the escape button.

*Note: If there are no inputs for 20 seconds, OSD menu will exit itself automatically.*

To save changed values you must execute the “Save mode” function.

*Note: Pressing Enter button and up button simultaneously will reset OSD settings to factory values.*

Main menu and sub menus functions:

- Navigate → Up/down buttons
- Select → Enter button
- Exit → Escape button

Adjust or toggles values with the up/down buttons.

4.1    **Setup**

Function	Description
PD_SOURCE	Select PD source: VGA (RGB), DVI
PD_OUTPUT	Select PD output format: All timings of timing table → VGA_60, SVGA_60,...

Table 12: OSD setup

## 4.2 Information

No input possible.

Function	Description
Display	Single / dual Format, i.e. RGB Display type, i.e. DIS-2
PD	Source, i.e. Video_1 Input timing Output window
SD	Source, i.e. Video_1 Input timing Size

Table 13: OSD information

## 4.3 Saturation

Function	Description	Default
SATURATION	Set saturation Values: 0 – 255 Value 0 = black/white	64

Table 14: OSD saturation

## 4.4 OSD Position

Function	Description
OSD H POS	Change horizontal OSD position
OSD V POS	Change vertical OSD position
OSD AUTO	Center OSD
ALPHA	Alpha-value of OSD Non transparent: 31 Transparent: 0

Table 15: OSD position

## 4.5 Firmware

No input possible.

Function	Description
	Not used

Table 16: OSD firmware

## 4.6 Gamma

Function	Description	Default
GAMMA	Set Gamma values. Values: off, 1 to 7	off

Table 17: OSD Gamma

## 4.7 Size

Function	Description
PD_H_SIZE	Change horizontal size PD
PD_V_SIZE	Change vertical size PD
PD_H_POS	Change horizontal position PD
PD_V_POS	Change vertical position PD
PD_H_CAP	Change horizontal capture value PD
PD_V_CAP	Change vertical capture value PD

Table 18: OSD size

## 4.8 ADC (only VGA (RGB) analog mode)

Function	Description
PHASE	Set phase, values: 0 – 31
CLOCK	Set AD transformer sampling rate Values: sampling rate +/- 120

Table 19: OSD ADC

## 4.9 Save mode

Function	Description
SAVE MODE	Save changes.

Table 20: OSD save mode

## 4.10 Sharpness

Function	Description	Default
SHARPNESS	Sharpness ON/OFF	off

Table 21: sharpness

## 4.11 Contrast

Function	Description	Default
CONTRAST	Set contrast. Values: 0 – 255.	62

Table 22: OSD contrast

## 4.12 Brightness

Function	Description	Default
BRIGHTNESS	Set digital brightness (no backlight!) Values: 0 – 255.	130

Table 23: OSD brightness

# CHAPTER 5

## Maintenance and Service

## **5 Maintenance and Service**

### **5.1 Cleaning**

ALWAYS turn OFF the power, unplug the power cord and remove the battery before cleaning. The exterior of the system and display may be wiped with a clean, soft, and lint-free cloth. If there is difficulty removing dirt, apply non-ammonia, non-alcohol based glass cleaner to the cloth and wipe. An air gun is recommended for cleaning water and dust. For salty water please clean with fresh water then blow-dry with an air gun. Be sure not to turn the display up side down while there is water being applied.

### **5.2 Troubleshooting**

Should the display fail to function properly, the troubleshooting steps below may be followed.

- Check AC/vehicle adapter, battery, and the power source.
- Minimize the configuration, i.e., remove extra peripherals and devices.
- Check OSD Settings (i.e. brightness settings)
- Remove the software suspected.
- Set BIOS fail-safe default.
- Re-install operating system and application software.

### 5.3 Service

If troubleshooting steps are unsuccessful, consult your dealer for service.

If they can not help you please call roda Service Center.

Service address: roda computer Center Bredenhop 20 32609 Hüllhorst  Phone.: +49 5744-944 470 Fax: +49 5744-944 475 E-Mai: support@roda-computer.com	Service: Mon – Thu 8:30 am - 12:30 pm & 1:00 pm - 4:30 pm Fri 8:30 am - 12:30 pm & 1:00 pm - 3:00 pm
--	--

*Note: The roda Service Center needs a detailed description of the problem and the serial number of the device.*

If it is necessary to send in your computer for repairs, you can download a service waybill (Service Supply Note) on the roda homepage ([www.roda-computer.com](http://www.roda-computer.com)), which you have to fill in.



### 5.3.1 Service Supply Note:

## Service Supply Note

Please check carefully if parts are really defective before returning the device. If we can not find any malfunction, we will have to invoice a lump sum for testing and working time of EUR 69.

**roda computer GmbH**  
Landstraße 6

**77839 Lichtenau**  
**Germany**

From: \_\_\_\_\_ Customer No.:

--	--	--	--	--	--	--	--

Company: \_\_\_\_\_

Street: \_\_\_\_\_

Postal Code/ Town: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Date of Return: \_\_\_\_\_

**To be completed from roda-business partner**

☐ Warranty (only accepted with confirmation) ☐ with costs

Following devices are returned:

items	roda Reference No.	Invoice No.	Date of Invoice
		DR _____ R	

Item: \_\_\_\_\_ Serial Number: \_\_\_\_\_

Please give detailed description of failure: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

(“defective” is not a correct description!)

Provided accessories: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Contact person for enquiry call (+ phone No.): \_\_\_\_\_ e-mail-address of contact person: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**To be completed by roda computer GmbH**

Provided accessories: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Packing on the outside: \_\_\_\_\_  
Packing on the inside: \_\_\_\_\_  
Damages: \_\_\_\_\_  
Notes: \_\_\_\_\_  
 \_\_\_\_\_

Date: \_\_\_\_\_ Arranged by: \_\_\_\_\_ roda order no.:

--	--	--	--	--	--	--	--

EK 1H 723 8 1

Figure 10: Service Supply Note

Include this sheet with the following information:

- Name
- Address
- Serial number, Customer number, Article number
- Place and date of purchase or the original invoice number
- Date of failure
- A DETAILED description of the problems you have encountered
- A list of the hardware/ software configuration, if applicable

### 5.3.2 Downloads

Check our website ([www.roda-computer.com](http://www.roda-computer.com)) for downloads:

- Updates
- Drivers
- Manuals
- Service Supply Note

# Annex

ANNEX

## Annex

### Annex A: List of abbreviations

A	Ampere (unit)
AC	Alternating Current
ADC	Analog to Digital Converter
BIOS	Basic Input Output System
C	Celsius (unit)
CD	Compact Disk
cd	Candela (unit)
CE	Conformité Européene
CRT	Cathode Ray Tube
CVBS	Colour Video Blanking Signal
DC	Direct Current
D-sub	D-subminiature (Sub-D)
DVI	Digital Visual Interface
EMV	Elektro-Magnetische Verträglichkeit
EN	Europäische Norm
F	Fahrenheit (unit)
FCC	Federal Communication Commission
GHz	Giga-Hertz (unit)
GND	Ground
Hz	Hertz
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
I/O	Input/Output
IP	Ingress Protection
kHz	Kilo-Hertz (unit)
LCD	Liquid Crystal Display
LED	Light Emitting Diode
mAh	Milliampere Hour (unit)
MHz	Mega-Hertz (unit)
OSD	On Screen Display
PC	Personal Computer
POST	Power On Self Test
RD	Ruggedised Display
RGB	Red Green Blue (Video signal)
TÜV	Technischer Überwachungs Verein
UL	Underwriters Laboratories
USB	Universal Serial Bus

V                    Volt (unit)  
VGA               Video Graphics Adapter  
W                   Watt (unit)

**Annex B: Table of power supply connectors for different countries**

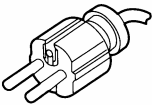
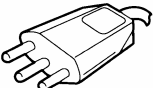
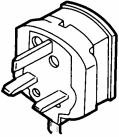
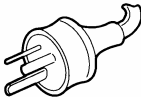
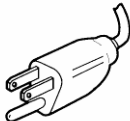
Version	Country/region	Technical data
	Europe	230V, 50Hz, 6A
	Switzerland	220V, 50Hz, 6A
	Great Britain	240V, 50Hz, 6A
	Australia	240V, 50Hz, 6A
	North America	120V, 60Hz, 7A

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